WORKSHOP AGENDA

Current Status and Future Enhancements to Animal Models for AIDS Research

September 23rd - 24th, 2019

Office of Research Infrastructure Programs

Office of AIDS Research

National Institutes of Health, Bethesda, MD

Hilton Rockville Hotel & Executive Meeting Center, Rockville, MD

Current Status and Future Enhancements to Animal Models

for AIDS Research

Purpose of the Meeting:

The Office of AIDS Research (OAR) and the Office of Research Infrastructure Programs (ORIP) are co-sponsoring a two-day highly focused, high-level workshop of experts in Animal Models for HIV research. These invited individuals will provide the necessary background and latest perspectives to understand the status of existing and emerging animal models, as well as gaps in knowledge and resources that limit or circumscribe their use in HIV research. Through a process of summary presentations and discussion groups, these experts will provide leadership to develop recommendations for NIH and the research community regarding current, emerging and potential enhancements to animal models for AIDS research.

Workshop Objectives:

- Identify the most important enhancements to existing animal models to support HIV research
- Identify the best animal models for specific HIV research goals (e.g., stage of infection, age groups)
- Identify new and emerging animal models that merit further development and support
- Determine how best to apply new technologies to improve and support animal models of HIV infection
- Promote sharing of models and samples

Conference Organizing Committee:

- Nancy L. Haigwood (Chair), Oregon National Primate Research Center, OR
- Ann M. Chahroudi, Emory University School of Medicine, GA
- Genoveffa Franchini, National Cancer Institute, National Institutes of Health (NIH), MD
- Mario Roederer, National Institute of Allergy and Infectious Diseases (NIAID), NIH, MD
- Francois Villinger, New Iberia Research Center, LA

NIH Organizing Committee:

- Sheri Hild, Division of Comparative Medicine (DCM), ORIP, Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI), Office of the NIH Director (OD), NIH, MD
- Brenda Fredericksen, OAR, DPCPSI, OD, NIH, MD
- Brigitte Sanders, NIAID, NIH, MD
- Ron Adkins, DCM, ORIP, DPCPSI, NIH, MD
- Miguel Contreras, DCM, ORIP, DPCPSI, NIH, MD
- Desiree von Kollmar, ORIP, DPCPSI, NIH, MD
- Lola Ajayi, ORIP, DPCPSI, NIH, MD
- Susan Chandran, Leidos, NIH contractor

Agenda Schedule:

Day 1

8:00 - 8:15 **Welcome and Charge to the Group**
Stephanie Murphy, DCM Director, ORIP, DPCPSI, NIH, MD
Nancy L. Haigwood, Oregon National Primate Research Center, OR

8:15 - 9:00 **Keynote Lecture**
Considerations in the Development, Optimization and Application of NHP Models for AIDS Research: A Personal Perspective
Jeffrey D. Lifson, National Cancer Institute, NIH, MD

9:00 - 9:15 Break

9:15 - 11:15 **Session 1: New Viruses and Models Session** **(Playlist)**
Session Chair: Ann M. Chahroudi, Emory University School of Medicine

9:15 - 9:35 ***The Need for Age-Specific NHP Models to Address Clinically Relevant Questions of HIV Infection and Prevention***
Kristina De Paris, University of North Carolina School of Medicine, NC

9:35 - 9:55 ***Optimizing Mouse Models for Testing HIV Vaccine Candidates***
Ming Tian, Harvard University, MA

9:55 - 10:15 ***Humanized Mouse Models to Study HIV Pathogenesis***
Jerome Zack, University of California - Los Angeles, CA

10:15 - 10:35 ***Epigenic Modulation of the CD4 Gene Leads to Downregulation of CD4 in African Green Monkeys***
Jason M. Brenchley, National Institute of Allergy and Infectious Diseases, NIH, MD

10:35 - 10:55 ***Novel SHIVs Encoding Minimally Adapted Transmitted/Founder Envs***
Katharine J. Bar, Penn Center for AIDS Research, PA

10:55 - 11:15 **Discussion**

11:15 - 12:15 **Session 2: Prophylactic Vaccines Session**
Session Chair: Genoveffa Franchini, National Cancer Institute, NIH, MD

11:15 - 11:35 ***Comparative Vaccine Approaches: Measuring Outcomes in Primate Models***
Genoveffa Franchini, National Cancer Institute, NIH, MD

11:35 - 11:55 ***CMV vectors: New Immunobiology Discovered in Rhesus Macaques***
Louis J. Picker, Oregon Health & Science University, OR

11:55 - 12:15 *Regulatory T Cells, and Antigen-Presenting Cells in the Mucosal Immune System (Presentation Not Avialable)*
Dennis Hartigan-O'Connor, University of California - Davis, CA

12:15 - 1:15 **LUNCH***

1:15 - 2:15 **Session 2: Prophylactic Vaccines Session (Cont.)**

1:15 - 1:35 ***Epithelial Stem Cell-based AIDS Vaccine: Mucosal Immune Responses and Control of Transmission in Macaque***
Marie-Claire Gauduin, Texas Biomedical Research Institute, TX

1:35 - 1:55 ***HIV Biotherapy: Lessons from Simian Pegivirus Infection of SIV+ Macaques***
David H. O'Connor, University of Wisconsin-Madison, WI

1:55 - 2:15 **Discussion**

2:15 - 3:15 **Session 3: Non-Vaccine Prophylaxis**
Session Chair: Mario Roederer, National Institute of Allergy and Infectious Diseases, NIH, MD

2:15 - 2:35 ***SIV and NHP bNAbs to Model Antibody Based Intervention***
Rosie Mason, National Institute of Allergy and Infectious Diseases, NIH, MD

2:35 - 2:55 ***HIV bNAbs as PrEP and PEP in Primate Models***
Nancy L. Haigwood, Oregon National Primate Research Center, OR

2:55 - 3:15 ***Bispecifics and Engineering of bNAbs in Vivo***
Amar Pegu, National Institute of Allergy and Infectious Diseases, NIH, MD

3:15 - 3:45 **Break**

3:45 - 4:45 **Session 3: Non-Vaccine Prophylaxis (Cont.)**

3:45 - 4:05 ***Use of the Female Rhesus Macaque for Vaginal Microbiome Modification to Test Live Biotherapeutics***
Laurel Lagenaur, National Cancer Institute, NIH, MD

4:05 - 4:25 ***Pigtailed Macaque Model: Preclinical Safety and Efficacy Assessments of Multiple Prevention Technologies***
Dorothy L. Patton, University of Washington-Seattle, WA

4:25 - 4:45 **Discussion**

4:45 - 5:00 **Wrap Up and Plans for Day 2**
Nancy L. Haigwood, Oregon National Primate Research Center, OR

* Meals and light refreshments are at the expense of attendees. The government and/or government contractors are not involved in facilitating the provision of food and/or light refreshments.

Day 2

8:00 - 10:00 **Session 4: Cure Research in Animal Models**
Session Co-Chairs: Nancy L. Haigwood, Oregon National Primate Research Center, OR

8:00 - 8:20 ***Gene and Immunotherapy for HIV Cure***
Hans-Peter Kiem, University of Washington, WA

8:20 - 8:40 ***A Fully MHC-Matched Macaque Model of Allogeneic Stem Cell Transplantation***
Jonah B. Sacha, Oregon Health & Science University, OR

8:40 - 9:00 ***Approaches to Shock and Kill, ATI***
Maud Mavigner, Emory University School of Medicine, GA

9:00 - 9:20 ***Barcoded SIV and SHIV to Understand Reservoirs***
Brandon F. Keele, National Cancer Institute, NIH, MD

9:20 - 9:40 ***Engineering bNAb Expression in Vivo/AAV***
Alejandro B. Balazs, Harvard University, MA

9:40 - 10:00 **Discussion**

10:00 - 10:15 Break

10:15 - 12:15 **Session 5: Tools and Technologies**
Session Chair: Francois Villinger, New Iberia Research Center, LA

10:15 - 10:35 ***NHP Genomics: Resources and Tools for Transcriptomics and Immune Repertoire Analysis***
Steve Bosinger, Emory University, GA

10:35 - 10:55 ***Marking Bone Marrow Stem Cells in Vivo***
Cindy E. Dunbar, National Heart, Lung and Blood Institute, NIH, MD

10:55 - 11:15 ***Spatial Imagining of HIV/SIV***
Philip J. Santangelo, Emory University, GA

11:15 - 11:35 ***Fluorescently Marked Virus and bNAbs to Study Infected Cells***
Tom J. Hope, Northwestern University, IL

11:35 - 11:55 ***RNAscope Used for AIDS Research***
Claire Deleage, National Cancer Institute, NIH, MD

11:55 - 12:15 ***Repeated Biopsy Sample Collection Methods Used in AIDS Research***
Jeremy Smedley, Oregon Health & Science University, OR

12:15 - 1:15 LUNCH*

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1:15 - 2:45 In Depth Discussion of Current and Future Needs (Breakout Groups)
Led by committee members

G.1. What are the most critical improvements to existing models needed and how can models and sample be shared more broadly?
Group Led: Mario Roederer

G.2. What are the best models for each stage of the infection cycle (e.g., prevention, early infection, suppression/reactivation, aging with HIV) and different age groups (newborn, adolescent, adult, aging)?
Group Led: Ann Chahroudi

G.3. What new or under-utilized models merit development (e.g., pigtail macaques, cynomolgus macaques, marmosets, or humanized mice or organoids)?
Group Led: Francois Villinger

G.4. How can emerging technologies (e.g., imaging) be leveraged to facilitate HIV research in animal models?
Group Led: Nancy Haigwood

2:45 - 4:00 Final Discussion and Preliminary Recommendations
Entire group

4:00 Adjourn